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AFRL moves toward buffet suppression system

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WRIGHT-PATTERSON AIR FORCE BASE, Ohio — The Air Force Research Laboratory has coordinated an important step in an international effort to create the next generation buffet suppression system. Participants included the Air Vehicles Directorate, NASA Langley Research Laboratory, and the national research laboratories for Canada and Australia. Participants successfully verified F/A-18 vertical tail dynamic response characteristics for an active buffet suppression system.

Buffeting occurs when high performance aircraft, such as the F/A-18, operate at high angles of attack. During these conditions, vortices from the aircraft's leading edge create turbulent flows and dynamic loads that vibrate the aircraft's vertical fins and horizontal stabilator. Prolonged buffeting can cause fatigue damage that restricts aircraft capability and availability. Scientists are testing data to develop an active control algorithm for use in a full-scale fin buffeting suppression system. The resulting algorithms will undergo closed-loop testing in January.

This testing builds upon a previous effort by the group demonstrating the feasibility of using an active buffet suppression system. Scientists calculated that applying the system to current F/A-18 fighter craft could increase structural life by approximately 4,000 hours. However, issues with the system's ability and failure at high buffet loads as well as its size and weight required further experimentation. The current program aims to eliminate dynamic load related problems through the use of advanced directional piezoactuators, the aircraft rudder, switch mode amplifiers, and advanced control strategies. This system will enhance the abilities of the current fighter aircraft fleet. @